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COMMISSION ON HUMAN RIGHTS
Forty-ninth session
Agenda item 27

SITUATION OF HUMAN RIGHTS IN THE TERRITORY OF THE FORMER YUGOSLAVIA

Letter dated 25 February 1993 from the Executive Director of United Nations Children's Fund to the Chairman of the Commission on Human Rights

I am writing to you during the current session of the Human Rights Commission, to put on record UNICEF's position in response to the violations of the rights of children and women taking place in the former Yugoslavia, with particular emphasis on the use of rape as a means of waging war.

The Commission has already reviewed the events to which I refer. In fact, Mr. Tadeusz Mazowiecki, the United Nations Special Rapporteur, while introducing the extensive report which he submitted to the Commission, said:

> "International opinion has been particularly outraged by the distressing reports we have received about the rape of women and children. I am profoundly shocked by the magnitude of this phenomenon, an extremely cruel and degrading practice that affects the most vulnerable groups in society. Annexed to my report you will find the results of the investigation conducted by a team of international experts appointed for that purpose. It is less important here to specify the exact number of victims as to stress the massive and criminal character of (these events)."

This week the Security Council took the decision to establish an international tribunal to deal with violations of international humanitarian law in the former Yugoslavia. This is the first time the United Nations has decided to establish an international criminal court with the jursidiction to prosecute crimes committed during armed conflict.

Mr. Chairman, I write today to voice support of these moves and to note that it is extremely important that the special rights of children and women be addressed. At the same time, other elements besides the legal ramifications must be dealt with. Victims must be cared for, and the root causes must be loosened in their tenacious grip.

Many of the pervasive sentiments of outrage which led to this act by the Security Council were reflected in the debate in the Human Rights Commission. A significant number of countries raised the issue of rape of women and girl children, including: Austria, Canada, Denmark on behalf of the European Community, Egypt, Finland on behalf of the Nordic nations, Germany, Hungary, Pakistan and Tunisia.

The actual "Report on the situation of human rights in the territory of the former Yugoslavia", as submitted by Mr. Mazowiecki, tells a shocking story. Findings of the report that relate specifically to this plight of children and women include:

> "...Rape by soldiers is increasingly used as a weapon of war against women and girls...
>
> "...The vast majority (of the documented pregnancies) were specifically identified by the physicians or the victims as being the result of rape by paramilitary soldiers...
>
> "...Rape has been used as one method to terrorize civilian populations in villages, forcing ethnic groups to leave...
>
> "...they (the team of experts) heard of no attempts made by anyone in a position of authority to try and stop the raping of women and girls. In fact, some of those in power actively participated in it...
>
> "...Rape of females has encompassed the entire age spectrum, from children to elderly women, in all areas of the conflict..." (a 10-year old victim was specifically mentioned in the report.)
>
> "...The team of experts has observed that children have been and are continuing to be exposed to war trauma directly, as well as through the media and through listening to parents' and other adults' graphic discussions of traumatic events, including rape, in their presence...
>
> "...Rape of women including minors has occurred on a large scale...
>
> "...rape has been used as an instrument of ethnic cleansing."

I understand that the findings of the report of the Special Rapporteur are broadly consistent with factfinding reports prepared by others, including Amnesty International, the UNHCR, the European Community, the World Council of Churches, Physicians for Human Rights, Helsinki Watch and the Conference on Security and Cooperation in Europe (CSCE). Security Council resolution 798 (18 December 1992) refers to the kind of acts documented in these reports as acts of "unspeakable brutality".

The Special Rapporteur, in a separate section understandably dedicated to "The particular suffering of children", invokes at the outset the Convention on the Rights of the Child, noting that it, "inter alia prohibits the torture, abuse or neglect of children and provides for their protection in all circumstances."

The Convention on the Rights of the Child is the international community's latest human rights instrument, still being ratified in record time in a record number of countries, even as many of its protection provisions are being flagrantly violated. Of the 41 articles in Part I of the Convention, fully 17 have evidently been breached in whole or in part by the events in the former Yugoslavia. UNICEF draws to your attention certain of the sections where the violations are most egregious and most harmful:

Article 2, sub 2:

> "States Parties shall take all appropriate measures to ensure that the child is protected against all forms of discrimination or punishment on the basis of the status, activities, expressed opinions, or beliefs of the child's parents, legal guardians, or family members"...

Article 3, sub 1:

> "In all actions concerning children... the best interest of the child shall be a primary consideration"...

Article 6, sub 1:

> "States Parties shall ensure to the maximum extent possible the survival and development of the child"...

Article 19, sub 1:

> "States Parties shall take all appropriate legislative, administrative, social and educational measures to protect the child from all forms of physical or mental violence, injury or abuse...including sexual abuse"...

Article 27, sub 1:

> "States Parties recognize the right of every child to a standard of living adequate for the child's physical, mental, spiritual, moral and social development"...

Article 34:

> "States Parties undertake to protect the child from all forms of exploitation and sexual abuse"...

Article 37:

"States Parties shall ensure that:

(a) No child shall be subjected to torture or other cruel, inhuman or degrading treatment or punishment"...

(b) No child shall be deprived of his or her liberty unlawfully or arbitrarily"...

Article 38, sub 1:

"States Parties undertake to respect and to ensure respect for rules on international humanitarian law applicable to them in armed conflicts which are relevant to the child"...

Article 38, sub 4:

"In accordance with their obligations under international humanitarian law to protect the civilian population in armed conflicts, States Parties shall take all feasible measures to ensure protection and care of children who are affected by armed confict"...

Article 39:

"States Parties shall take all appropriate measures to promote physical and psychological recovery and social reintegration of a child victim of: any form of neglect, exploitation or abuse; torture or any other form of cruel, inhuman or degrading treatment or punishment; or armed conflicts. Such recovery and re-integration shall take place in an environment which fosters the health, self-respect and dignity of the child".

Such alleged violations of the Convention on the Rights of the Child also contravene provisions of other major international human rights instruments, including: the Universal Declaration of Human Rights; the International Covenant on Civil and Political Rights; the Convention against Torture and other Cruel, Inhuman or Degrading Treatment or Punishment; the Convention on the Elimination of Racial Discrimination, and the Convention on the Prevention and Punishment of the Crime of Genocide.

In addition to these instruments, Governments at the highest political level worldwide, in the World Summit for Children Declaration and Plan of Action, endorsed the concept of children as a zone of peace, and committed themselves to further develop innovative forms of providing protection to children in war situations. The Declaration states:

"We will work carefully to protect children from the scourge of war...

"Each day, countless children around the world are exposed to dangers that hamper their growth and development. They suffer immensely as casualties of war and violence... as refugees and displaced children,

forced to abandon their homes and their roots... as disabled, or as victims of neglect, cruelty and exploitation."

In the Plan of Action, leaders acknowledge specifically:

"Children need special protection in situations of armed conflict... Resolution of a conflict need not be a prerequisite for measures explicitly to protect children and their families to ensure their continuing access to food, medical care and basic services, to deal with trauma resulting from violence and to exempt them from other direct consequences of violence and hostilities."

Mr. Chairman, these promises apply not only to children within one's country, but to all children. In the case of the former Yugoslavia, the international community is raising its voice against what it believes to be the brutal targeting of children and women as victims of war.

It is tragically unfortunate that, for the last many years, and with increasing intensity, children and women have become gratuitous targets in warfare in many parts of the world. Unspeakable attrocities have occurred far from the public eye and the lens (or interest) of the media, although they are well documented in the reports of United Nations agencies and NGOs. The public outcry that has arisen in defence of children victimized in the former Yugoslavia is no doubt, equally warranted in a number of other situations.

The situation in the former Yugoslavia has galvanized the international community; it is critical that the sentiment generated by the horrible events be transformed into the means to help deter any such actions from taking place in the future, both in the former Yugoslavia and throughout the world. If we act on the crescendo of international concern, we can take a crucial step in the battle for human rights.

Of the various recommendations made in the reports of those who have investigated the damage in the former Yugoslavia, UNICEF finds the following to be of primary importance:

1. All victims of rape, women and children, must have access to complete medical, psychological and where necessary, psychiatric care. Programmes of social reintegration must also be available, pursued at the community level, and within the context of support for the family.

2. Children who suffer trauma as the result of witnessing the rape of others, or who suffer trauma as a result of exposure to (in the words of the team of experts) "unspeakable abuses, cruelties, degradations or personal loss", must have access to a team of medical and emotional support.

3. Special attention must be paid to infants who have been born, or are expected to be born, as a result of rape. The question of adoption must be viewed with great care, consistent with article 21 (b) of the Convention on the Rights of the Child.

UNICEF further concurs in the Rapporteur's affirmation that we must avoid "...at all costs, the stigmatization of, or trafficking in, babies who are born as a result of rape".

4. All refugees and displaced persons should have the right to primary health care. We agree with the Rapporteur that such assistance should be provided within the framework of programmes to rehabilitate women and children traumatized by war.

5. Upon the cessation of hostilities, there should be crash courses for local trainees in counselling those who have suffered rape, chronic violence and trauma.

6. Peace education programmes should be instituted on as broad a scale as possible.

7. The United Nations agencies, and other appropriate international organizations, should develop a cadre of female human rights monitors.

8. All blockades of humanitarian aid supplies must be lifted immediately.

9. The act of rape should be designed a war crime, as asserted by the Special Rapporteur. The applicable Geneva Conventions of 1949 and related Protocols of 1977 suggest no other possible interpretation.

10. The United Nations, through the Centre for Human Rights, should monitor the situation in terms of the points made in this letter, even after hostilities have ceased.

No one pretends that the unleashing of ethnic hatreds is easily appeased. Learning peaceful co-existence with those of different ethnic roots also requires tremendous assistance and training. It is, however, UNICEF's contention that such a real and mature peace is within human reach. This elusive possibility could become reality, however, if, and only if, the international community will work together to uphold in practice the standards it has established in words.

(Signed): James P. Grant
Executive Director

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COMMISSION ON HUMAN RIGHTS
Forty-ninth session
Agenda item 14

HUMAN RIGHTS AND SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS

Letter dated 2 March 1993 from the Permanent Representative of the Federal Republic of Yugoslavia to the United Nations Office at Geneva addressed to the Assistant-Secretary-General for Human Rights

Referring to agenda item 14, "Human rights and scientific and technological developments" of the current session of the Commission on Human Rights, I have the honour to enclose herein a report entitled "Radioactive Waste Management in the Areas of Croatia Affected by War" prepared by the Croatian Government to be presented at the "Waste Management Symposium 93: HLW, LLW, Mixed Wastes and Environmental Restoration - Working Towards a Cleaner Environment" to be held in Tucson, Arizona, from 28 February to 4 March 1993.

The symposium is hosted and sponsored by: the American Nuclear Society, the United States Department of Energy, New Mexico State University and the Waste-management Education and Research Consortium (WERC), the Radwaste Systems Committee of the American Society of Mechanical Engineers and numerous commercial institutions. The conference is organized in cooperation with the International Atomic Energy Agency.

From the said report it can be seen that the Government of Croatia intends to exploit and to sell concessions for radioactive and other toxic waste dumping sites to foreign firms in regions where the majority and even the entire population is Serbian. Some of the territories concerned have been

under UNPROFOR protection for the past year (see Fig. 3: Mt. Petrova, Mt. Trgovska, Mt. Zrinska, Bilogora hills, Mt. Maslovacka, Mts. Psunj, Papuk and Krodija, Mt. Pozeska and the foothills of Mts. Dilj and Krodija). In that period, Croatia was not able to execute its plan on dumping waste in the region. On the other hand, judging by work carried out in absolute secrecy in West Slavonija (designated as Sector West in the Vance Plan for Croatia), it is highly probable that radioactive waste has already been reposited there.

In its efforts to accomplish its ages-long sick dream of an "ethnically cleansed" Croatia (i.e. with no Serbs), the Croatian Government is endangering the existence of its own citizens and of those of other European countries.

If these plans of the Government of Croatia are to be realized, the broader region of the Balkans and Europe will be exposed to unforeseeable ecological disaster since the geographic and natural characteristics of the regions selected as radioactive and other toxic waste dumping sites do not meet even the minimum of requirements particularly as regards geologic, seismologic and other characteristics of the sites.

The Federal Republic of Yugoslavia will do all within its power to keep the international community duly informed on this matter. We expect the international community to act and help prevent the realization of this monstrous plan.

I would kindly ask you to make the enclosed report available to the forty-ninth session of the United Nations Commission on Human Rights.

(Signed): Dr. Vladimir Pavicevic
Ambassador,
Chargé d'Affaires a.i.

Preliminary Program

"HLW, LLW, Mixed Wastes and Environmental Restoration — Working Towards A Cleaner Environment"

Hosted and sponsored by
The University of Arizona, also sponsored by
the American Nuclear Society, the U.S. Department of Energy,
New Mexico State University and the Waste-management Education
and Research Consortium (WERC), the Radwaste Systems
Committee of the American Society of Mechanical Engineers
and numerous commercial institutions. The conference is
organized in cooperation with
the International Atomic Energy Agency.

February 28 – March 4, 1993
Tucson, Arizona

WM Symposia, Inc.
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Suite 19
Tucson, AZ 85719 U.S.A.

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GENERAL INFORMATION

REGISTRATION--Registration will be held at the Main Lobby, TCC, Sunday, February 28, 1993 from 3:00 p.m. to 8:00 p.m. resuming every morning at 7:15 a.m. Technical registration includes four lunches, Sunday Reception, Wednesday Banquet and one copy of the published proceedings. Advance registration is recommended.

SUNDAY RECEPTION AND REFRESHMENTS--Sunday, February 28, 1993 from 5:00 p.m. to 8:00 p.m. in the Crystal Ballroom, TCC. Hosted by NUS Corporation, US Ecology, Inc., and JGC Corporation of Japan.

REFRESHMENTS--Drinks and pastries will be served before the sessions and during breaks in the Exhibition Hall while exhibits are open at other times in the vicinity of the sessions. Tea and scones sponsored by BNFL Inc.

EXHIBITION RECEPTION--Monday and Tuesday, March 1 and 2, 1993, 4:00 p.m. - 5:30 p.m., Exhibition Hall, TCC. Tuesday reception is a Minifiesta sponsored by Lockheed.

SECOND POLISH-RUSSIAN ROCK'N'ROLL PARTY--Tuesday, March 2, 1993, 5:30-7:30 p.m. in the Holiday Inn Starlight Lounge and Patio. Celebrating the 5th anniversary of the Weapons Complex Monitor and the inauguration of the Post Soviet Weapons Complex and Business Monitor Publications.

ADVISORY COMMITTEE BANQUET AND PARTICIPANT MIXER--A choice will be offered from four banquets on Wednesday, March 3, 1993 from 6:00 p.m. to 11:00 p.m. These are: Old Tucson (western), Old Tucson (swinging jazz), Gaslight Theater, and racing at the Dog Track. The Gaslight is limited to 225. (Priority on registration date) Sponsors of the banquets, mixer & refreshments are:

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(Sunday Reception & Breaks)
WASTECHEM/ENSR
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(Co-Sponsor Swinging Jazz)

WEDNESDAY, MARCH 3, 1993 AM

8:30 AM--XXV. Packaging and Transportation of Radioactive Materials
Co-chair: Albert E. Castagnacci, Duquesne Light;
Larry Blalock, USDOE-HQ
SO(s): Richard Yoshimura, SNL;
David Boyer, Ian Porter, BNFL

1. Roadmaps: EM's Issue-based Planning Process and How It Supports Transportation Management's Critical Mission-Pat Noblett, Dick Redmond, Audrey McAllister, Nick Suttora, EDM; Larry Blalock, Gerald Boyd, USDOE

2. From DAD to TRAIN: Evolution of State-Federal Relations in Radioactive Waste Transportation-Max S. Power, WA Dept. of Ecology; Bob Robison, OR Dept. of Ecology; Douglas Larson, Jim Miernyk, WSEB

3. LSA & SCO Determinations Key to Managing Low Level Wastes-Dennis L. McCall, WHC

4. Millstone Steam Generator Packaging, Shipment, and Disposal-James Braun, CNSI

5. Tracking Low-Level Radioactive Waste on a Nationwide Scale: Complications and Considerations-Michael Klebe, IL Dept. of Nuc Safety; N. Richard King, RSCC

6. The WIPP Transportation System-Refinement in Motion-T. R. Ward, WEC; R. Spooner, USDOE

7. Potential Economic and System Advantages of the Introduction of a Short Legal Weight Truck Cask System into the Federal Waste Management Transportation System-R.W. Peterson, E.J. Bentz, Jr., C.E. Bentz, E.J. B & A

8. Irradiated Fuel Transport-Two Decades of European Experience-L.G.T. Panton, NTL (UK)

8:30 AM--XXVI. Progress in HLW Characterization, Pretreatment and Solidification
Co-chair: Len Sjostrom, USDOE-SR;
Gary Bracken, USDOE-RL
SO(s): Ned Bibler, SRL
Dick Sills, BNFL

1. Characterization of High Level Waste Concentrate-R. Berg, U. Schaarschmidt, M. Weishaupt, D. Fang, WAK (GERMANY)

2. Installation, Start-up, and Operation of a PUREX High-Level Waste Sludge Mobilization and Wash System at the West Valley Demonstration Project-M. A. Schifthauer, S.C. Thompson, WVNS

WEDNESDAY, MARCH 3, 1993 AM

3. Action of Sodium Hydroxide Dilutions Upon the Properties of Actual and Simulated Double Shell Hanford Tank Waste-B.M. Rapko, Joel Tingey, Sam Bryan, PNL

4. Development of a Nitric/Formic Acid Process to Reduce Hydrogen Emissions During Sludge Treatment in the DWPF. Results with Simulated and Actual Radioactive HLW Sludges Containing Noble Metals-C.W. Hsu, D.M. Ferrara, N.E. Bibler, B.C. Ha, J.A. Ritter, WSRC

5. Calcination of HLW with High Aluminum Content by Low Temperature Plasma-A.S. Aloy, V.Z. Belov, A.V. Strelnokov, Radium Institute (RUSSIA)

6. Laboratory-Scale Vitrification and Leaching of Hanford High-Level Waste for the Purpose of Simulant and Glass Property Models Validation-E. V. Morrey, M.L. Elliott, J.M. Tingey, PNL

7. Leaching of Borosilicate Glasses Incorporating Simulated High-Level Radioactive Wastes Using Draft ASTM (PCT) Procedure-Harsh K. Manaktala, Prasad K. Nair, SWRI

8. Statistical Acceptance of West Valley HLW Glass-A. Drobot, J.L. Mahoney, WVNS

8:30 AM--XXVII. Status of Nuclear Waste Programs-Part I
Co-chair: Earl McDaniel, ORNL;
Candace Chan, IAEA
SO(s): Earl McDaniel, ORNL;
Candace Chan, IAEA

1. Waste Management and Disposal Strategies in IAEA Member States with Nuclear Power Programmes-D.J. Squires, PNL; C.Y. Chan, IAEA (USA/AUSTRIA)

2. Strategy Selection for Management and Rehabilitation of Contaminated Territories in Republic Belarus-V.M. Efremenkov, SCC (BELARUS)

3. Present Practices and Innovative Treatments Developed in Solid and Liquid Waste Management in India-M. Ramaswamy, I.J. Singh, S.K. Samanta, P.K. Wattal, BARC (INDIA)

4. Deep Repository Development-Progress in the UK-H. Beale, C.S. Mogg, UK Nirex (UK)

5. Nuclear Waste Program in Ukraine-L. Bogdan, H. Mykolaychuk, (UKRAINE)

6. Laguna Verde Station Approach to Nuclear Waste-Augusto Vera, CFDE (MEXICO)

7. The Radioactive Waste Management in the Areas of Croatia Affected by War-Damir Subasic, Antun Salaj, Marijan Gunaric, Mladen Novakovic, CRMA (CROATIA)

8. Design and Licensing of the El Cabril LLW Disposal Facility-Carmen Ruiz, CSN; Pablo Zuloaga, Jesus Alonso, ENRESA (SPAIN)

1:30 PM--XXVIII. Education, Training and Technology Transfer
Co-chair: Margery Olson, SAIC;
Ron Bhada, WERC
SO(s): Margery Olson, SAIC;
Albert E. Castagnacci, Yankee Atomic

1. EM Five-Year Plan Education Initiatives: Bringing Students into the Planning Process-Catherine [illegible], USDOE; L. James, SAIC

2. Selling Cleanup Technologies to the Public: Watch Out for the Car Salesman Mentality--It Doesn't Work-Brenda Flory, WCM; Edward Helminski, Exchange Publications

3. Transferring Federally-Funded Technologies: New Strategies for Success-Erik J. Stenehjem, PNL

4. The Environmental Fair: Oak Ridge's Success Story in Educational Outreach-Gail E. Rymer, MMES

5. Multiple Regulation Training: Integrating a Mixed Bag of Mixed Waste-Gregory B. Hayward, KE; James E. Gamin, WHC

6. Training and Qualification of Waste Management and Remedial Action Personnel at the Oak Ridge National Laboratory-A.F. Frederick, ORNL

1:00 PM--XXIX. Poster-Defense High-Level Waste
Co-chair: Harry Babad, WHC;
George Mellinger, USDOE-HQ (PNL)

1. ICPP Waste Management Technology Development Program-G.W. Hogg, A.L. Olson, D.A. Knecht, WINCO; M. J. Lenkoski, USDOE

2. Development of Waste Cost Manual for Savannah River Site-G.H. Street, B.K. Taylor, J.P. Harley, WSRC

3. Advancing the U.S. Department of Energy's Waste Tank Remediation Technologies Through the Underground Storage Tank-Integrated Demonstration Program-T.E. Gates, WHC

4. Study on the Colloids Generated from Testing of High-Level Nuclear Waste Glasses-Xiangdong Feng, S.C. Buck, C. Mertz, J.K. Bates, J.C. Cunnane, ANL

5. Time and Motion Simulation of the WRAP Module 1 Facility-Kenneth D. Van Zanten, UE & C; John R. Weidert, WHC

6. 1/12-Scale Physical Modeling Experiments in Support of Tank 241-SY-101 Mitigation-James Fort, J.A. Bamberger, J.M. Bates, Carl W. Enderlin, PNL

7. Access and Isolation of Single Shell Tanks and Tank Farms-K. Wentzel, D. L. Russell, K&M Engr.; H.R. Johnson, W.K. Overbey, BDM

8. Low Temperature Aqueous Destruction of Organic and Ferrocyanide Contaminants in Hanford Tank Waste-E.O. Jones, H. Babad, L.R. Pederson, A.J. Schmidt, PNL

9. Remediation of Hanford Tank Waste Using Magnetic Separation-Laura A. Worl, Larry R. Avens, Karen J. de Aguero, F. Coyne Prenger, Walter F. Stewart, Dallas D. Hill, LANL

10. Development and Demonstration of the TRUEX Solvent Extraction Process-George F. Vandegrift, D.B. Chamberlain, C. Conner, J. A. Dow, J.C. Hutter, R. A. Leonard, L. Nunez, D. G. Wygmans, J. Sedlet, J. M. Copple, B. Srinivasan, M.C. Regalbuto, S. Weber, M. Regalbuto, L. Everson, ANL

11. Chemical Oxygen Demand of Hanford Storage Tank Wastes: Information for Pretreatment and Tank Safety Issues-C.D. Carlson, PNL

12. Destruction of Organics and Decomposition of Nitrates in UST Wastes by Steam Reforming-Terry R. Galloway, ST; R.G. Dosch, J.L. Sprung, SNL

13. Decomposition of Tetraphenylborate Precipitates Used to Isolate Cs-137 from Savannah River Site High-Level Waste-D.M. Ferrara, N.E. Bibler, B.C. Ha, WSRC

14. Pretreatment Technology Development Activities for Resolving Hanford Tank Safety Issues-S.A. Colby, WHC

15. High-Level Waste Management and Treatment Program for Analytical Laboratory-A.G. King, R.T. Steele, D.L. Baldwin, K.A. Poston, PNL

16. Infrared Scanner Parametric Test Using Heated-Simulant Tank Waste-L.E. Efferding, WHC

17. An In Situ Characterization Tool for Waste Tank Materials Based on Raman Optical Scattering with Fiber Optic Probes-F.R. Reich, WHC

18. Integrated Instrument Platform for In Situ Characterization of Tank Wastes-S.J. Eberlein, WHC

SITE SELECTION OF RADIOACTIVE WASTE REPOSITORY IN THE REPUBLIC OF CROATIA

IZBOR LOKACIJE ODLAGALISTA RADIOAKTIVNOG OTPADA U REPUBLICI HRVATSKOJ

A.Saler

Javno poduzece za zbrinjavanje RAO
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ABSTRACT - The radioactive waste repository site-selection procedure in Croatia is divided into two stages: the first, related to the exculsionary screening of the national territory and comparision of potential areas in order to identify preferred sites acceptable for inclusion into the Regional Plan; and the second, comprising all necessary field investigations as well as additional site-characterization tasks planned to be worked out at a few preferred sites. Several potential areas, representing an intermediate goal of the first stage, are defined til now.

SAZETAK - Postupak izbora lokacije odlagalista radioaktivnog otpada u Republici Hrvatskoj sastoji se od dvije faze: prva se odnosi na izlucno vrednovanje teritorija drzave i poredbenu analizu potencijalnih podrucja s ciljem identifikacije preferentnih lokacija prihvatljivih za uvrstavanje u Prostorni plan RH; dok se u drugoj fazi provode potrebna terenska istrazivanja, kao i dodatne aktivnosti predvidjene na dvije do tri najprikladnije lokacije. Do danas je utvrdjeno nekoliko potencijalnih podrucja, koja predstavljaju medjufazni cilj u iznalazenju preferentnih lokacija.

1. Introduction

The Republic of Croatia is faced with an actual problem -the final disposal of radioactive waste-that is closely related to some significant aspects of social life.Development of national economy and environmental preservation are most important of them

. The present quantities of radioactive wastes, generated from the various sources in Croatia-industry, medicine and scientific institutions- do not exceed 53 m3, but the Republic of Croatia is additionally obliged to repose a half of all wastes generated at the Krsko NPP. During the lifetime of this plant, sited in the Republic of Slovenia but being a joint venture of both the republics of Slovenia and Croatia, about 20.000 m3 of low-(LLW), intermediate-level (ILW) and decomissioning radioactive wastes are expected to be generated /1/. Hence, to construct a radioactive waste repository seems to be an inevitable duty of Croatia soon. But, in the same time, it presents a possible benefit for future development of an independent national economy as well. Of course, it should not be neglected that the environment, as a very precious resource, ought to be exploited only in accordance with conservative protection requirements, existing in the world practice.

2. Background

In order to select the radioactive waste repository site, attention should be paid to the repository design options and rock types available. The leading principle in both the objectives is to ensure the environmental safety, and not to save the money. Consequently, a tunnel-type repository in hard rocks seems to be the most acceptable repository design option in Croatia.Due to lack of flat areas having a solid, igneous or metamorphic lithology, as well as a lack of thick layers of clays or marls, the surface or shallow-ground disposal is hard to be expected. Since almost a half of Croatia is not convenient for repository siting due to prevailing karst (in the southern part of the country), and remaining flat areas are mainly unsuitable due to major acquifers having high water-table (along the rivers Sava, Drava and Danube); the regions of interest are the mountains in the interior. The most of them are horst-structures composed to a great extent of granite, gneiss and schists /2/. According to the results of available investigations, the horizontal tunnel, constructed at the slopes of these mountains, seems to be the most probable repository design option /3/.

3. Site Selection

3.1 Concept Description

The global concept of the Radioactive Waste Repository Project in Croatia includes a few main task groups being interferred. Besides Site Selection, it comprises Licencing Activities, Technology & Design Development,Safety Assessment, Economic Evaluation, Transportation Analysis and Waste Characterization. The whole project is supported by activities on Legislation Development.

Since there is an urgent economic need to ensure additional energy sources in Croatia, the site selection of thermo-electric -and nuclear power plants is being taken into consideration in the same procedure as well.

The Site Selection generally includes two stages: the first, site survey stage, terminating with inclusion of candidate sites into the Regional Plan of Croatia, and the second, site evaluation stage, aiming to define the final repository site through field investigations and other necessary actions.

At present, the first stage of the site selection is under way. It includes the actions that are extremely sensitive since defining of site selection methodology and criteria, as well as achieving political and public acceptance for repository siting have to be done before defining and including the candidate sites in to the Regional Plan. The planned activities are projected to be performed through two steps: (1) regional analysis and selection of potential areas; and (2) selection of preferred sites (Figure 1/.

Philosophy of the site selection is, at first, to define exclusionary criteria for the global reconnaissance of Croatia in order to find out potential areas. After comparative and additional exclusionary criteria are defined, potential areas will be subdued to more detailed evaluation aiming to identify a

number of potential sites. Through comparison of potential sites and their internal characterization, a few preferred sites are forseen to be find out. These preferred sites are supposed to be included into the Regional Plan of Croatia. In the second stage, detailed site investigations will be worked out at two or three preferred sites, resulting with identification of the final repository site.

In accordance with the above mentioned site selection performance, the aiming areas are defined as follows: potential areas represent larger areas (100-600 sq.km), characterized by acceptable isolation properties, potential sites are smaller areas (5-20 sq. km) derived from potential areas, having homogeneous structure favourable for siting radioactive waste repository, and preferred sites are small areas (2-20 sq. km), highly acceptable for the repository siting and able to be nominated for the Regional Plan /3/.

3.2. Description of the Performed Activities

The activities on radwaste repository site selection in Croatia began in 1988. Until Slovenia and Croatia have not been proclaimed as independent states, the preliminary activities on repository site selection in both republics (i.e. states) were being managed by the Inter-republic Co-ordination Commission in order to harmonize the site slection procedure in both countries. In Croatia, the Ministeries of Energy and Regional Planning, through the Croatian Electricity Management Board, committed to the institute for Urban Planning of Croatia to perform the study Site Screening, Investigation and Assessment of Site Suitability of Fossil Fuel power Plants and Nuclear Facilities on the Territory of the Republic of Croatia. The goal of the Study is identification of preferred sites for thermal- and nuclear power plants as well as radioactive waste repository in order to nominate them for the Regional Plan of Croatia. Until July 1989 the set of exclusionary criteria was defined. Validation of criteria was carried out by the Croatian Government. Using the method of exclusionary screening of the

whole territory of Croatia /Figure 2/, eight potential areas were identified in autumn 1990 /Figure 3/. Collecting of additional data on potential areas and defining comparative criteria were main project activities being worked out during the rest of 1990 and terminated in August 1991. Methodology and criteria were assessed by the IAEA Radioactive Waste Management Advisory Programme (WAMAP) as high graded /1/. Due to war operations in our country, the validation of these criteria, being commited to the Government is still under way.

4. Site Acceptable Assessment

In the site slection process it would be insufficent to find out only the host-rock able to provide waste containment i.e. to keep water away from the waste. According to accepted approach it is recognized that it is the entire system - waste form and package, host-rock units, surrounding host-rock units, and environment in the region - that provides waste containment and isolation. In keeping with this philosophy the applied criteria try to address all site characteristics which contribute to waste containment and isolation. These charasteristics include geo-technical and socio-economic concerns. In applying these criteria, greater consideration is given to those criteria that directly influence the safety of the repository than to criteria which affect only repository cost and timeliness.

In the final analysis, repository licencing and operation can only proceed when it can be demonstrated that the total repository system, including the waste form and its packaging, the design of the engineered facilities and barriers, and the multiple natural barriers, performs adequately to protect public-health and safety and to preserve the quality of the environment /4/.

In the performed stage of site selection and characterization, the following exclusionary criteria have been applied:(1)Lithology & geomorphology; (2) Hydrogeology - acquifer

protection: (Neotectronics- fault activity: (4) Seismicity- maximum acceptable earthquakes; (5) Hidrology - flooding protection; (6) Demography-population density; (7) Mineral and ore exploitation: (8) Nature preservation; (9) Culture heritage protection; and (10) National defense /5/.

For the further site selection i.e. identification of potential sites, series of comparative site-acceptance criteria considering all necessary geotechnical and regional-planning requirements will be applied to /Figure 4/. According to their individual site-acceptance roles, the specific weighting factors will be given to each criterion. Weighting factors will be defined by the expert team.

5. Conclusion

The construction of radioactive waste repository in Croatia is going to be "condition sine qua non" in near future. Due to existing and foreseen radwaste quantities - generated at various sources - that Croatia is obliged to repose, there is no dolemma "whether to construct the radioactive waste repository or not", but "where and how to construct it in order to preserve the envioronment and human health". Hence, the cooperation of experts and the public in the affairs related to radioactive waste management in general, is a real assumption leading to the satisfying solution of the problem i.e. to attain an efficacious isolation system for radionuclides contained in disposed waste. In order to achieve this goal, the world practice related to site-selection, repository design options, licencing and economic evaluation of radioactive waste disposal, will offer a valuable support.

References

/1/ " The Mission Report", Radioactive Waste Management Advisory Programme (WAMAP), IAEA, Vienna, 1991

/2/ Saler A., General Approach and Site Selection Criteria for Low- and Intermediate Level Radioactive Waste Repository in Yugoslavia", Proceedings of 28th International Geologic Congress, Washington, D.C. 1991.

/3/ "Site Survey Stage of the Siting Process for Low - and Intermediate-Level Radioactive Waste Disposal Facilities",The Institute for Urban Planning of Croatia, Zagreb. 1991.

/4/ "NWTS Criteria for the Geologic Disposal of Nuclear Wastes: Site-Qualification Criteria", ONWI Staff, US Department of Energy, 1980.

/5/ "Kriteriji za izbor lokacija za termoelektrane i nuklearne objekte", Vlada RH, Zagreb, 1991.

RADIOACTIVE WASTE REPOSITORY SITE-ACCEPTANCE CRITERIA APPLIED IN CROATIA

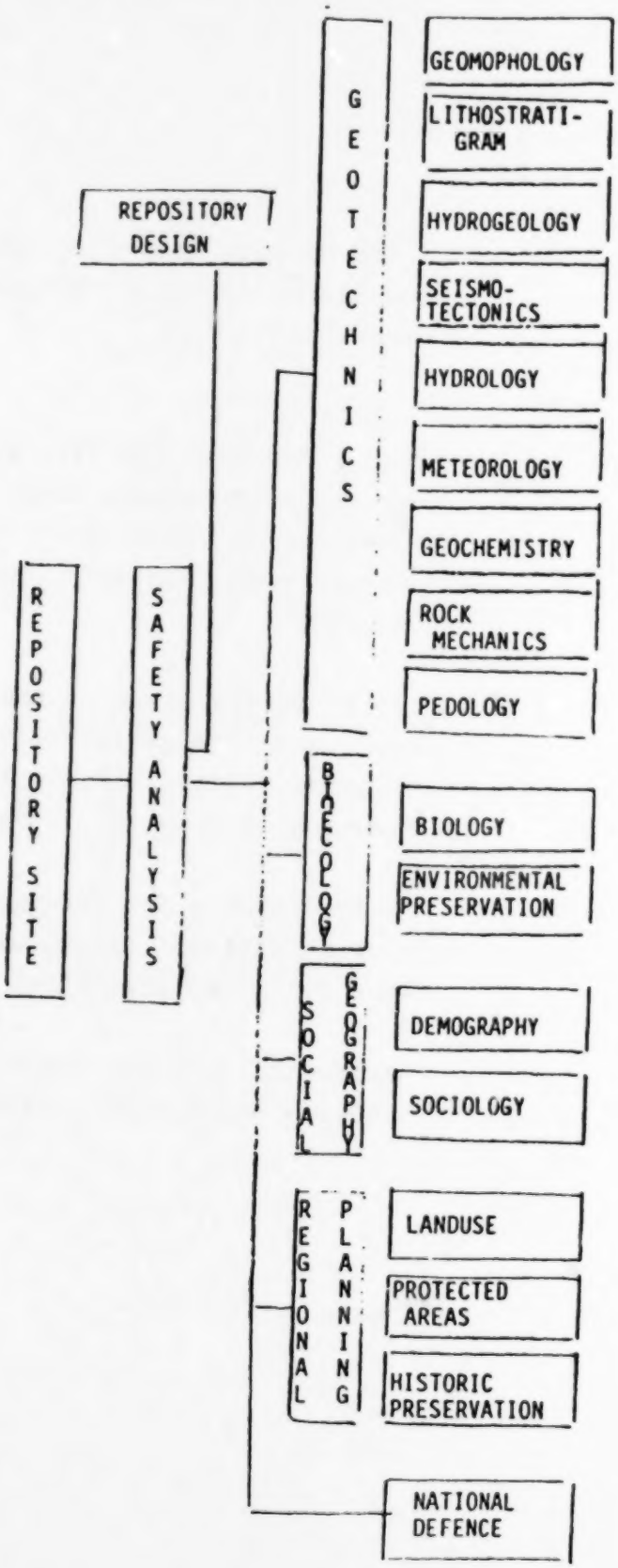
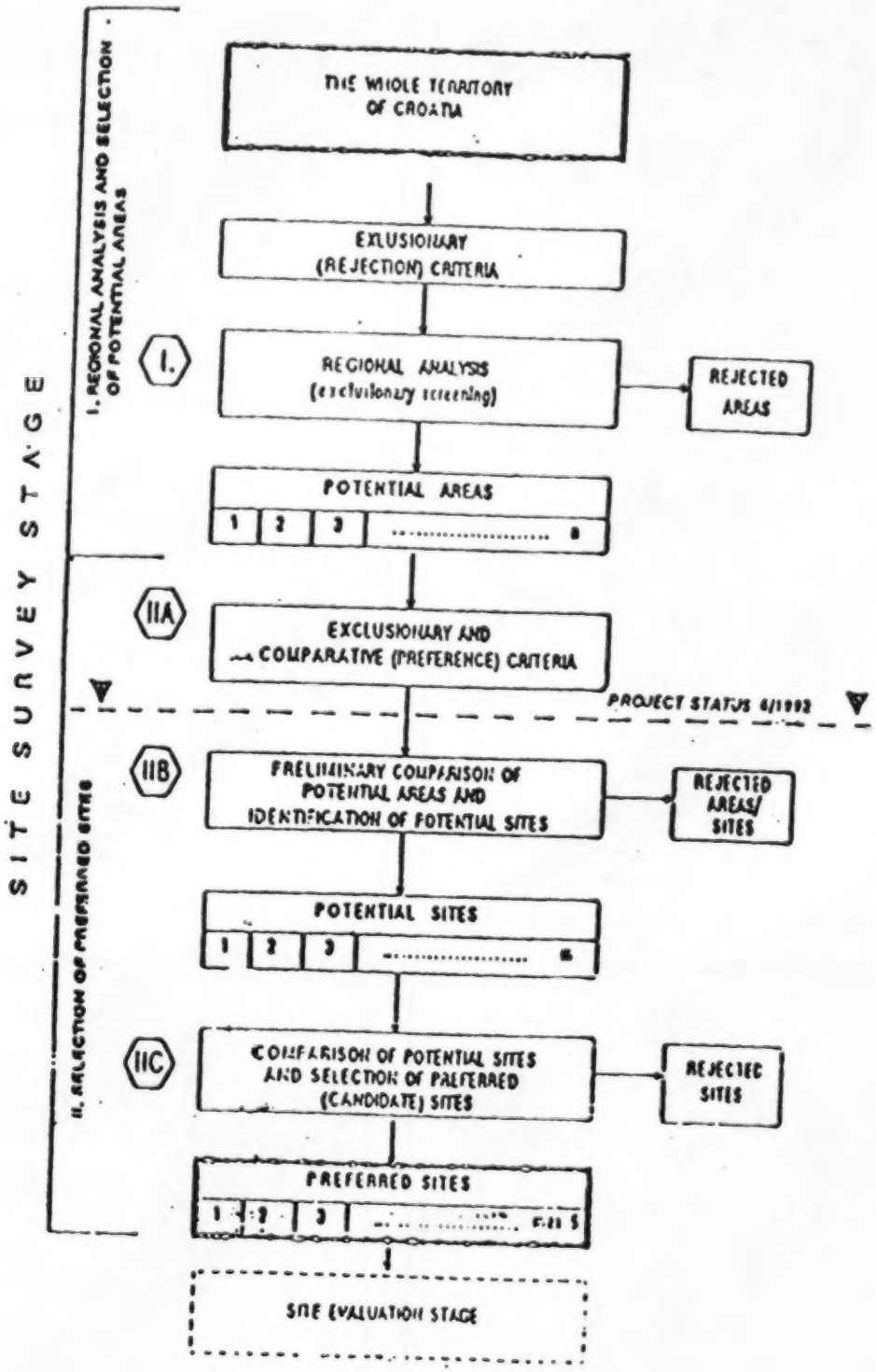
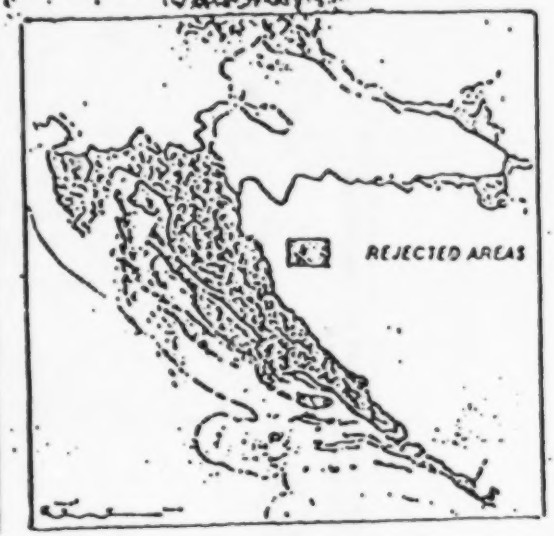


FIG. 1. SCHEME OF THE RADIOACTIVE WASTE REPOSITORY SITE SELECTION IN CROATIA



GEOMORPHOLOGY: Slope dynamics

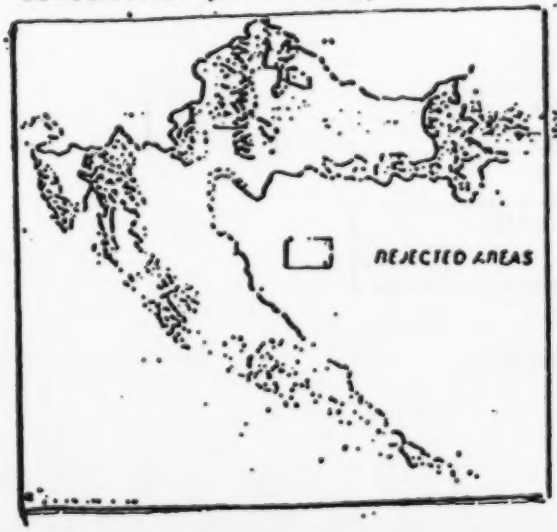
HYDROGEOLOGY: Solubility to groundwater



SEISMICS & TECTONICS: Earthquake intensity and faulting

HYDROLOGY: Risk of flooding

DEMOGRAPHY: Population density



RESULTS OF EXCLUSIONARY SCREENING

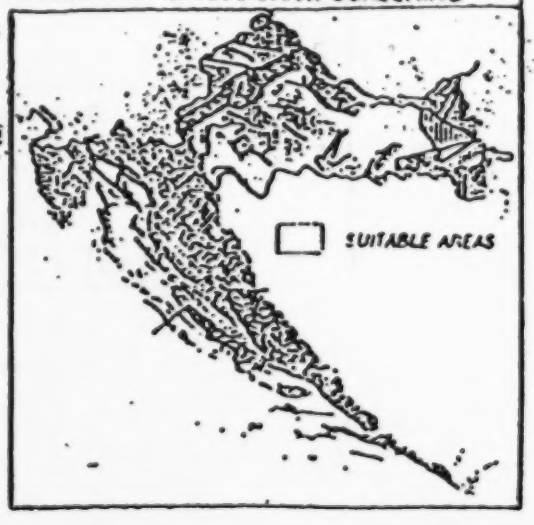
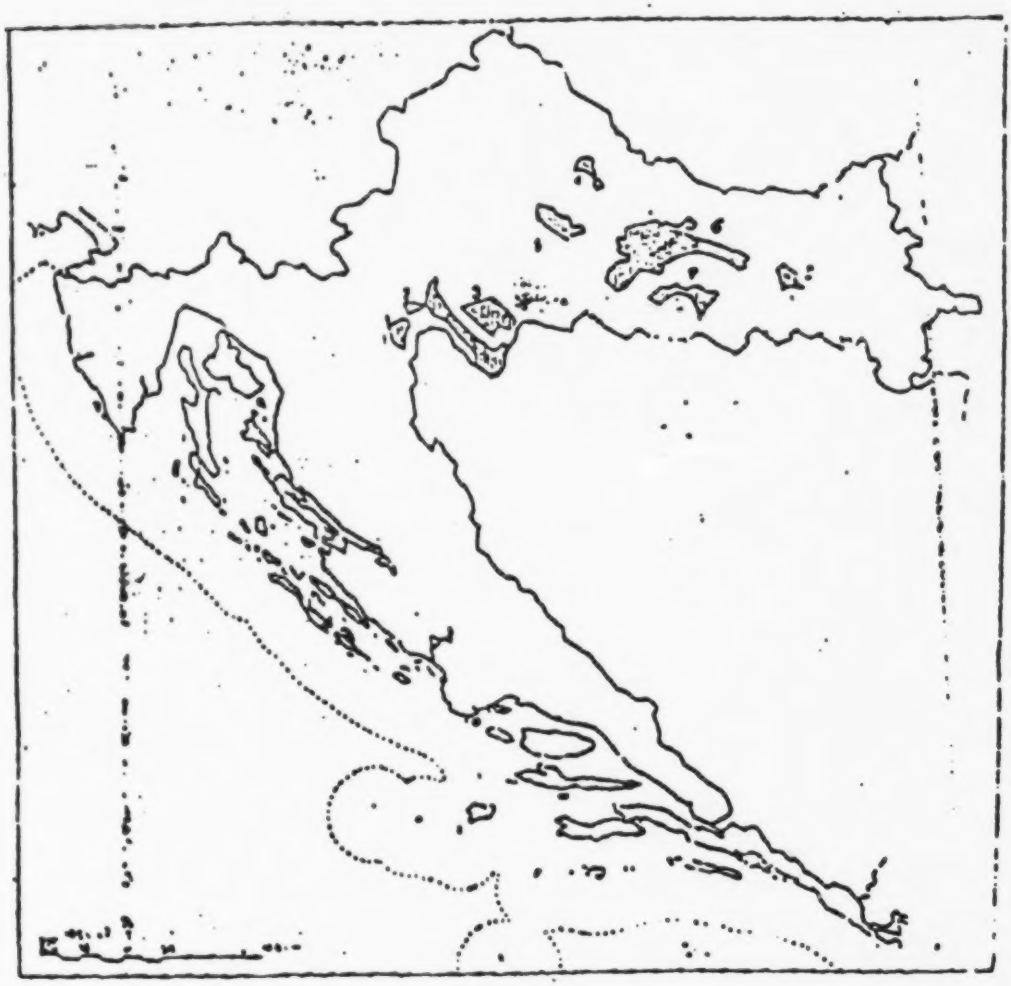


FIG. 3 RADIOACTIVE WASTE REPOSITORY SITE SELECTION STAGE I : IDENTIFICATION OF POTENTIAL AREAS



1 - Petrova gora mountain

2 - Trgovska gora mountain

3 - Zrinska gora mountain

4 - Bilogora hills (NE slopes)

5 - Moslavačka gora mountain

6 - Psunj, Papuk and Krndija mountains (NE parts)

7 - Požeška gora mountain

8 - Eastern foothills of Ural and Krndija